8 Recovery, Analysis and Storage of Quartz Assemblages – Recommendations

8.1 Introduction

The research into archaeological quartz has three main stages, namely:

- recovery of quartz artefacts and assemblages in the field
- analysis of the recovered quartz finds in the laboratory
- storage of the recovered quartz.

The three elements of quartz research are interconnected, in the sense that the initial choice of recovery policy defines which inference may be made at a later stage, and how detailed this inference can become, and it defines the museum storage requirements. Each of these stages is characterized by its own set of methodologies, and, due to the notable differences in appearance, availability, and flaking properties (see Section 4), archaeological quartz research has been less fruitful than the research into worked flint. To a degree this may be perceived as a historical problem, as the output level of quartz research, as well as the quality of this output, has been improving steadily. However, quartz research is still affected by quartz-specific problems, such as the recognition of quartz in the field, interpretation of the recovered finds, and storage of the frequently very large quartz assemblages. These problems are addressed in this section.

8.2 Recovery policies

As mentioned above, many of the difficulties relating to archaeological quartz research are historical by nature. In terms of recovery policies, these problems may be sub-divided into two groups, namely, (i) difficulties relating to the more lax recording procedures of early archaeology, such as, limited stratigraphical observation and recording of finds either by site or by trench, rather than by grid unit or context (as, for example, in the case of most quartz assemblages from Jura; eg Mercer 1968; Mercer 1971; Mercer 1972), and (ii) quartz-specific problems relating to the recognition of worked quartz (causing the introduction of selective recovery of formal core and tool types; eg Hamilton 1956; Calder 1956; Calder 1964).

General excavation procedures have improved over the years, with quartz artefacts now being recorded meticulously by layer and grid unit, or by context. The second problem, however, still remains. Archaeological quartz is as difficult to recognize as ever, and it must be assumed that, even today, a proportion of the archaeological sites' content of worked quartz is not being collected. As a consequence, quartz assemblages, or sub-assemblages, may still be less representative than flint assemblages.

The best way to deal with this problem is probably to acknowledge that archaeological quartz is best dealt with by an experienced *quartz* specialist, that is, not simply a general lithics or flint specialist. When consulted by excavators, inquiring about how to best deal with quartz in the field, the author usually suggests the introduction of the following two simple rules:

- *If in doubt, keep everything*, and allow the quartz specialist to sort the finds in the laboratory. It is always possible to discard unworked quartz later, whereas quartz artefacts missed in the field are missed forever.
- If this rule is not practical, for example due to the presence of excessive amounts of quartz, it is suggested to *keep all pieces with one or more sharp edges, and discard all rounded pieces*. The reduction of quartz, even the initial testing of quartz nodules, should lead to the production of at least one sharp edge. This rule is only unsuitable in connection with the excavation of previously transgressed or flooded sites, where post-depositional water action may have abraded the artefacts. In these cases, the first rule should be followed.

Obviously, adhering to these rules has as a consequence that large amounts of quartz may be recovered in the field, with subsequent implications for storage requirements and storage policies (see below).

8.3 Analysis

As mentioned above, the amount, character and quality of information gained from the analysis of quartz assemblages partly depends on the choice of recovery policy, but the experience of the analyst is also important, as is the specific choice of analytical approaches.

In terms of experience, it is crucial that the analyst is familiar with bipolar technology and the variation within bipolar products (cf Ballin 1999a), as this may shed light on the specific operational schemas of industries dominated, or influenced, by bipolar approaches. The analyst should also have a minimum of geological insight:

- to be able to identify the various sub-types of quartz (Section 4)

- to identify the possible sources of these quartz forms
- to distinguish between different sets of flaking properties
- to use this information to estimate the use-value (including symbolic value) of the different quartz forms, and define possible prehistoric territories and exchange networks (techno-complexes and social territories; Ballin 2007b).

The geological differences between quartz and, for example, flint (geological provenance, flaking properties, etc.) makes it imperative to separate the various raw materials and analyse the resulting sub-assemblages individually. Bulk analysis of, for example, quartz and flint artefacts tends to reduce the amount and quality of inference that may be gained from a lithic collection. In the presentation and discussion of the finds from the well-known Mesolithic sites on Jura (eg Mercer 1968; Mercer 1971; Mercer 1972) large sub-assemblages of flint and quartz (as well as some bloodstone and pitchstone) were dealt with as one combined assemblage, making it almost impossible to discuss matters, such as, different technological approaches (were two different operational schemas employed, one for quartz and one for flint and flint-like materials?), procurement strategies, social territories and exchange networks.

It is a well-known fact that burnt flint is a valuable source to the interpretation of intra-site spatial patterns and on-site behaviour (eg Ballin forthcoming j), particularly with regards to the identification of 'latent' hearths (the distinction between 'evident' and 'latent' structures was made by Cziesla 1990, 257, in his dissertation on settlement dynamics; also see Stapert 1987; Stapert 1989; Stapert 1990; Stapert 1992). Burnt quartz is practically never mentioned in reports on quartz-bearing sites, and it does not form an integral part of the interpretation of these sites. This is mainly due to the fact that burnt quartz, due to the specific attributes of this raw material, is much more difficult to identify than burnt flint, and the research into this matter is still in its infancy (eg Gonick 2003; Ballin forthcoming k). Presently it appears that burnt quartz takes two forms, namely, (i) dull, crackled and disintegrating white or grey quartz, and (ii) shiny, yellow-brown quartz with 'peeled-off' surfaces. It is possible that form (i) is connected to ordinary settlement activities, like most crazed flints, whereas the other form may relate to heat-treatment of quartz, or it may be the result of exposure to fire combined with specific soil conditions (particularly the iron-rich, acidic conditions of Scottish peat areas; see discussion in Section 2.4.11). It is hoped that, in the future, the recognition and discussion of burnt quartz may form a standard part of general quartz analysis, as burnt flint does to general flint analysis.

The comparison and interpretation of quart assemblages may be influenced by the analyst's choice of classification system. Any classification system must be tailored to fit the material under investigation, and, to allow comparison between assemblages, a standardized classification system should be employed by all quartz specialists. In central and northern Scandinavia (see Section 3), the difficulties relating to quartz research were largely seen as products of an inappropriate typology borrowed from flint research (Broadbent 1979; Callahan 1987; Knutsson 1998), and it was attempted to develop a specific quartz typology. This, however, had as a consequence that quartz assemblages and flint assemblages were no longer directly comparable (see for example Lehane's 1986 attempt at using a Scandinavian classification system on a Scottish quartz assemblage), and what would one do in cases where a specific assemblage was based on the simultaneous exploitation of equal amounts of different raw materials?

Consequently, the author advices against this practice. As demonstrated in the lithic analyses undertaken as part of the present project (eg Ballin 2002b; Ballin 2007a; Ballin forthcoming j), it is quite practicable to apply the same typology to all raw materials. The difference between quartz and flint assemblages is not so much that other tool types are manufactured in quartz, but that quartz assemblages – due to the different flaking properties of this material – may be based on different blanks, such as a larger proportion of chunks, thick flakes and abandoned cores or core fragments. These differences are revealed by the detailed characterization of the finds, which forms part of the general classification process.

The most central problem to quartz classification – that it is difficult to recognize retouch on quartz tools – is not going to be solved by the development of any new approach or method. It is a consequence of the physical appearance of this material (its shiny, reflective surfaces; in the case of rock crystal, the material's transparency), and the recognition of retouch on quartz is, and will remain, a matter of experience. The author has only made one observation, which may be helpful to lithics analysts, namely that retouch on quartz is much easier to identify when scrutinized from the 'lower face' of the piece (ie the face from which the retouch was initiated), rather than from the 'upper face' (ie the face affected by the removals, the reliefed surfaces of which are usually much more reflective).

8.4 Storage policies

Generally, the storage requirements of quartz artefacts correspond to those of artefacts in flint and flint-like raw materials. Lithic materials are predominantly hardy and durable and, in most cases, they do not require special attention. Consequently, ordinary quartz artefacts do not call for individual packaging, that is, there is no need for acid-free paper, silver foil, bubble-wrap or cling-film, and bulk packaging is acceptable (that is, multiple pieces per bag or box). The only exceptions are (i) artefacts in poorer qualities of quartz, characterized by excessive numbers of cracks and planes of weakness; (ii) burnt quartz artefacts; and (iii) exceptionally thin (mostly the more elegant and well-made) pieces. Burnt quartz, and objects in poor-quality quartz, tend to disintegrate, and the more elegant, thin pieces may break. In these cases, it may be necessary to bag the artefacts individually, occasionally even wrap them in some form of protective material.

The above guidelines may seem obvious to most specialists, but occasionally large quartz assemblages have been stored inappropriately – that is, in an excessively protective manner – which may make later re-examination of the assemblages unnecessarily time-consuming, or even prevent later analytical use of these finds. On one occasion, the author examined a large lithic assemblage which had been wrapped individually in acid-free paper, whereas, on another occasion, an equally numerous assemblage had been wrapped individually, first in silver-foil, and then in cling-film. In both these situations, the 'unwrapping process' required an input of an extra three to five days – which had not been included in these projects' general design or budget.

However, the most important point, in terms of storage policies, is the fact that many quartz assemblages are numerous, and, due to the flaking properties of this raw material, most quartz artefacts are somewhat chunkier than, for example, flint artefacts. As a consequence, archaeological quartz may take up large parts of museum stores. If the excavation of a specific quartz-bearing site was not carried out by a quartz-specialist, and the excavator chose to adhere to the advice given in Section 8.2 (that is, all quartz, or all sharp-edged quartz, was recovered), what would have been large collections if excavated according to standard methodologies, would grow even larger.

Therefore to prevent the storage of considerable amounts of natural quartz from occupying storage space unnecessarily it should be attempted to keep the time from initial storage to final examination and discard of unworked material to a minimum. It is not uncommon that an initial quartz collection is reduced by as much as 50–75%, and if the initial collection numbered, for example, 20 large standard boxes, the savings, in terms of museum storage space, would be considerable.